

I. BACKGROUND

- A. Purpose.** The purpose of this plan is to assure the appropriate balance is achieved in protecting the prime natural and cultural resources of Coyote Canyon while providing high quality visitor enjoyment. Actions undertaken by the Department are guided by the responsibility to protect our most valued natural and cultural resources. Special attention is given to the sensitive resources, including the flowing sections of Coyote Creek and the associated large riparian stands, that are home to a number of endangered and threatened wildlife species. For the purposes of this report "Coyote Canyon" will refer to all California State Parks land in the Coyote Creek watershed.

Several factors have created an urgent need to update public use planning in Coyote Canyon. The public recognition of the need to protect wetland and riparian resources has expanded dramatically since roadways and public use patterns were established for the canyon many years ago. Numerous state and federal laws as well as formal policies of the California Department of Parks and Recreation (CDPR) mandate strict protection of wetland resources (including riparian areas, marshlands and adjacent open waters) and sensitive species. Currently, the access roadway that provides travel through the canyon from Borrego Springs at the south, north to the town of Anza, passes directly through Coyote Creek in several places. Motorized vehicles, equestrians, hikers and bicycles use this roadway. The placement of the roadway within the creekbed violates mandates and policies prohibiting this practice. Virtually all land use agencies, including CDPR, have specific guidelines precluding motorized vehicle use in wetlands. For example, "buffer guidelines for perennial watercourses prohibit OHV activity within 15 feet of the edge of the watercourse, with stream crossings bridged or engineered to prevent erosion" (CDPR Off Highway Motor Vehicle Recreation Division, Soil Loss Standards, 1991). At a minimum, the spirit and intent of the guidelines developed for State Vehicular Recreation Areas (SVRAs) apply to other state park lands and specifically to the Upper and Middle Willows portions of Coyote Canyon.

In this plan, the management of Coyote Canyon is being addressed at an ecosystem-level, recognizing the complex interplay of the natural, cultural and physical features that make up the area. Management decisions are being made after considering the long-term implications of all issues and are not intended to address the protection of a single species or the concern of a single user group. This approach is aligned with recent federal and state initiatives that recognize the importance of preserving biodiversity and of multi-species and multi-use planning.

There are a number of factors that warrant immediate examination.

1. The need to establish routine guidelines for formally designating the route of vehicle roads and trails after flood washouts. This is necessary to avoid damaging sensitive resources and to improve recreational opportunities.

2. The need to change existing use patterns so that public use is in compliance with current policies with minimal impact on: (1) the habitat of listed species, (2) the integrity of sensitive vegetation communities, (3) the long-term preservation of Significant Natural Areas (SNA), (4) the preservation of cultural resources and (5) State Wilderness Area recreation activities.
3. The need to incorporate into this planning effort the latest information available from state and federal resource databases and other sources on sensitive species, sensitive habitats, ecosystem functioning and SNAs occurring within Coyote Canyon.
4. The need to identify and consider all the major cumulative impacts occurring in Coyote Canyon, including those involving vehicle use, hikers, campers, mountain bikers, equestrians, wild horses, non-native plant and animal invasions, natural flooding and impacts from low elevation aircraft flyovers.

B. History. The beauty of this picturesque and accessible canyon has, for many years, attracted thousands of backpackers, campers, equestrians, mountain bikers and motorized vehicle users. Visitor use in Coyote Canyon has grown dramatically over the last forty years, from a few jeeps a year, after World War II, to as many as 17,000 vehicles, with an average of 9,000 vehicles a year over the last fifteen years. Of the total number of vehicles, an estimated 20%, or 1,800 per year, travel north of Lower Willows into Collins Valley, Middle and Upper Willows. The walls of the canyon are steep with undulating and rocky topography dropping to low alluvial valleys and finally to a sandy wash that follows the canyon bottom. As a result, the easiest route of travel is along the valley floor and many of the existing roads and trails are located in the lushly vegetated canyon bottom, often in the flowing creek. Therefore, people and sensitive resources are in direct and frequent contact along the canyon bottom.

Many recreationists use Coyote Canyon including club organized events specifically planned for the canyon. For example, since the late 1970's or early 1980's, the Hemet Chamber of Commerce has sponsored the annual Hemet Jeep Club Cavalcade trip through Coyote Canyon. Each spring, under permit by State Parks, approximately 100 to 150 club vehicles drive down the canyon from the town of Anza into the Borrego Valley. In addition, up to 300 mountain bikes from San Diego Bicycle Club make the Clunker Classic ride each November. The remote backcountry atmosphere and the scenic, challenging terrain, attract thousands of people each year.

In 1975, the Department began closing Coyote Canyon to all use each summer from June 15th to September 15th in order to protect bighorn sheep watering areas along the creek. The closure was based on years of observation by researchers and staff (CDPR files), and on a study that demonstrated vehicle use was directly impacting bighorn watering behavior (Jorgensen, P. 1974). The closure has resulted in improved access for bighorn sheep to historic watering sites along Coyote Creek at Lower, Middle and Upper Willows during the three hottest months of the year.

In 1983, a major portion of Coyote Canyon and its watershed (some 100,000 acres) was designated as a State Wilderness Area. This designation recognizes the exceptional wilderness qualities of the canyon and the regional significance of its resources, and also carries with it a requirement to manage the area according to State Wilderness Area guidelines.

In 1987, the Department realigned about two miles of Coyote Canyon road in order to bypass the wetlands areas of Lower Willows. The road now travels through adjacent rocky uplands, whereas it formerly passed directly through the creek for most of the two miles. This action was taken to avoid direct impacts to watering bighorn sheep, nesting endangered least Bell's vireo and other sensitive species, including birds nesting along the road in the riparian woodland.

The construction of the bypass road is part of an ongoing effort by the Department to protect and enhance least Bell's vireo populations throughout the park since the vireo's state listing as endangered in 1980 and the subsequent similar listing by the federal government in 1986. In April, 1993, least Bell's vireos were discovered nesting for the first time at Middle and Upper Willows. In February, 1994, the U.S. Fish and Wildlife Service (Service), Department of the Interior, designated Lower Willows as critical habitat for the least Bell's vireo. Middle and Upper Willows were not included because vireos had not been observed nesting at either location when the Service first delineated the boundaries of critical habitat.

Flash flooding is a common occurrence in Anza-Borrego Desert and throughout the Coyote Creek watershed. In winter, 1992-93, especially the night of January 16, 1993, flooding washed out about five miles of Coyote Canyon road, closing the entire canyon to vehicle access. The flood was judged by staff to be equal to or greater than Hurricane Kathleen in the late 1970s, which was described as a "100 year flood".

Two other cumulative human-related impacts occurring within the canyon are: (1) the use of Coyote Canyon as a low-level flyover corridor for military aircraft and (2) the occurrence of a herd of wild horses in upper Coyote Canyon. The aircraft use in Coyote Canyon is in violation of FAA regulations that prohibit flights at an altitude less than 2,000' over State Wilderness areas. However, military and other aircraft of various types are seen many times a day (and night), flying through the canyon, often under 200 feet. The most likely species impacted by the noise and visual presence of aircraft is the bighorn sheep. In addition, park staff have heard numerous complaints from recreational users of the canyon regarding the disruptive nature of these flights. Other less sensitive areas would surely provide a more appropriate location for military aircraft activities. The herd of 25-40 wild horses in upper Coyote Canyon is causing observed impacts on natural and cultural resources. These animals are protected under the federal Wild Horse and Burro Protection Act thereby limiting our management activities.

- C. Setting.** Anza-Borrego Desert State Park comprises roughly half the acreage of the entire State Park System and 87% of the State Wilderness system. Anza-Borrego is also an International Biosphere Reserve and a National Natural Landmark. Coyote Canyon is located

at the northwestern end of the park and makes up about one-sixth of the park or about 100,000 acres. It accounts for 23% of the total State Wilderness area in California. The natural and cultural resources of Coyote Canyon are among the richest of any area in Southern California and are considered to be the most extensive in all of the 600,000 acre Anza-Borrego Desert State Park.

Coyote Canyon includes portions of both San Diego County and Riverside County. It is an eighteen mile long canyon occurring along the San Jacinto fault zone. The elevation in the canyon ranges from 650 feet above sea level in the southern canyon to 3,900 feet at the northern end. The watershed of Coyote Creek originates in the steep mountains to the west (Bucksnot Mt., Combs Peak and Anza Ridge) and the Santa Rosa Range to the north and east. The watershed encompasses about 154 square miles. Annual precipitation within the watershed ranges from around 35 inches in the mountains to 6 inches in the lower canyon. Coyote Creek and the associated watershed is the principal source of groundwater recharge for the Borrego Valley aquifer. This aquifer provides much of the available water for residential and agricultural uses throughout the Borrego Springs area. Therefore, it is critical to the local economy that the watershed be maintained to provide abundant flows of clean water.

The canyon narrows to less than 100 yards wide as it passes through the three willow oases known as Upper, Middle and Lower Willows. These perennial reaches of the creek occur where bedrock outcrops force subsurface water flow to the surface. As the creek runs southeasterly, Nance, Tule, Parks, Alder, Salvador, Sheep, Cougar and Indian Canyons are tributaries to the west, and Horse, White Wash and Box Canyons are tributaries to the east. The canyon widens into Collins Valley, approximately one and one half miles wide by three miles long, just above Lower Willows. The volume of water flow in the creek is usually only a few cubic feet per second on average, however, major flash floods occur every few years in winter or late summer.

As a result of the presence of water and the three willow oases, Coyote Canyon is considered one of the most verdant riparian wetlands of the California desert (Warner and Hendrix, 1985), making this an extremely important regional resource. Riparian vegetation covers about 40 acres at Upper Willows, 54 acres at Middle Willows and about 120 acres at Lower Willows. The total area of riparian woodland and palm oasis habitat in the other side canyons within Coyote Creek watershed is estimated at approximately 75 acres (based on current infrared aerial photography interpretation). The size and shape of each area covered by woodland is subject to dramatic change from periodic flash flooding and drought. Floods, such as the January 1993 storm (referred to in Section IB. above), can scour huge areas of the riparian woodland away in seconds, thereby temporarily reducing habitat and potentially causing alterations in local hydrology. An estimated twenty-five percent of the willow woodlands in the canyon bottom were lost in this flood.

The lushness of the riparian woodlands along Coyote Creek provides sharp contrast to the dry, sparse and low growing vegetation of the adjacent desert scrub. The riparian areas are

characterized by dense stands of willow, *Salix exigua* and other species; cottonwood, *Populus fremontii*; California fan palms, *Washingtonia filifera*; thickets of mesquite, *Prosopis sp.*; catclaw, *Acacia greggii*; mulefat, *Baccharis sp.*; and arrowweed, *Pluchea sericea*. These riparian species are found only where there is a generous supply of water. The riparian woodlands and associated open aquatic habitat support a vast number of sensitive wildlife and plants as well as a host of more common species that would not be observed in the desert were it not for these wet habitats. The canyon and its watershed are home to the largest segment of the Peninsular bighorn sheep (*Ovis canadensis cremnobates*) population of this region. A listing of sensitive species known to occur within Coyote Canyon either as residents or seasonally is presented in Table 1. Also included in this table is a listing of 5 species that are expected to occur here, that have not been observed and formally documented.

- D. Cultural Resources.** Coyote Canyon provides a rich series of prehistoric/historic Native American living areas. The canyon, with its permanent water sources and strategic location as the northwest travel corridor from the desert to the high chaparral and on to the coastal areas, is Anza-Borrego Desert State Park's richest cultural resource area. More than eighty-five archeological sites, some of them major villages, have been recorded along the main creek in the canyon. State archaeologists report that many areas of the canyon remain unsurveyed, and therefore, potentially more sites remain yet to be identified and recorded.

As the former home of the Mountain Cahuilla, Coyote Canyon holds their legacy in the form of village sites, food gathering areas, food processing centers, rock shelters, rock art, trails, ceremonial and cremation places and sweatshouses. A variety of implements made out of stone, bone, shell, clay, and wood have been observed and documented.

According to Wilke (1986), the Cahuilla people may have settled in this area as early as 2000 years ago. Historically, the Mountain Cahuilla were often referred to as "Los Coyotes" and called themselves "wiwaistum", reportedly after an ancestor. They spoke a language belonging to the Shoshonean branch of the widespread Uto-Aztecan family. Divided into five lineages, permanent village sites were located along Coyote Creek with Wiliya as the central or founding village. The term Wiliya applied both to the central village site and to the whole of Coyote Canyon. Temporary sites and food processing centers were located in Sheep, Cougar, Indian, Salvador, Parks, Alder, Tule, and Nance Canyons.

The first European to enter and make note of Coyote Canyon and its inhabitants was Pedro Fages, in the fall of 1772, when he and a contingent of soldiers marched through the canyon in pursuit of deserters from the San Diego Presidio. Two years later, in March of 1774, Spanish explorer Juan Bautista de Anza and a party of 34 men travelled through Coyote Canyon. A year later Anza mounted an overland expedition of 240 colonists that left Sonora, Mexico, and reached Coyote Canyon in December of 1775, en route to found the present-day city of San Francisco. The diaries kept by Anza and his companions, Friars Francisco Garces, Juan Diaz, and Pedro Font, mention their encounters with Native

Americans and the permanent villages in Coyote Canyon. Today, some of the villages and other archaeological remains are in very close proximity to the jeep route that leads from the town of Anza to Borrego Springs.

In 1851, one of the most important military expeditions mounted by the U.S. Government in southern California took place at Lower Willows, Coyote Canyon. Antonio Garra, leader of the Cupeños, resented paying taxes to local authorities without proper political representation. Garra sought to organize a coalition of southern California Indians to drive out all foreigners. A raid on Warner's Ranch by Native Americans and the killing of homesteaders precipitated the punitive military expedition under the command of Captain Samuel P. Heintzelman. A skirmish between the insurgents and the soldiers occurred on December 20, 1851, at Lower Willows. Four tribal leaders found guilty by a military tribunal of conspiring or participating in the killings were executed by a firing squad on Christmas morning 1851. The Garra Revolt, as it was known, came to an end.

Homesteaders, prospectors, and cattlemen started to take over the land in Coyote Canyon in the 1870's and 80's. The Reed brothers, John Collins, William Fain, the Clark brothers, the Tripp brothers, "Doc" Beaty, and Howard Bailey, all contributed to the early pioneer history of Coyote Canyon. Not much remains of these early pioneer settlements. However, the prehistoric and historic villages of the Mountain Cahuilla are visible reminders of the Native Americans' long association with the land in Coyote Canyon.

E. Recreation Resources. Coyote Canyon is part of a 100,000 acre State Wilderness area. All areas in the San Diego County portion of the canyon except the designated roads and Collins Valley are included in the wilderness. The result is a vast tract of high quality wildlands that provide visitors with rare opportunities for enjoying the unique geology, flora, fauna and scenery of the canyon. The vastness, the solitude, the incredible vistas, the bighorn sheep and other wildlife, and the exotic nature of the three oases all combine to attract thousands of recreationists to the canyon each year.

Visitors gain access to the canyon in a variety of ways. Hikers make use of over 40 miles of hiking trails and a myriad of primitive camping opportunities. Equestrians have long used the area and have access to over 30 miles of trails in the canyon. Vernon Whittaker Horse Camp is a popular facility located just a few miles south of the Lower Willows area. The Pacific Crest Trail runs along the western rim of the canyon. For years, park users with four wheel drive vehicles have used the primitive roads in the canyon to reach its more remote and scenic areas. In recent years, an increasing number of mountain bikers have been attracted to the canyon.

II. ISSUES

In order to manage Coyote Canyon as an ecosystem, all natural and cultural resource issues outlined here are evaluated together with recreation demands to formulate land use policies for the area. Accordingly, these policies will be based on evaluation of all issues and not on one issue or on a single species. This section of the report describes the condition of the major resources and the current management concerns, especially those related to recreational use. While the principal resource impacts observed, and management policy conflicts, are attributable to the presence and vehicular use of the existing roadway, equestrian, bicycle and hiking within the creekbed also generate impacts.

A. Significant Natural Areas (SNA): Coyote Canyon has four sites officially designated by the State of California as SNAs. These are areas listed on the Department of Fish and Game's Natural Diversity Data Base (NDDDB) as having significant natural value based on regional, state and national criteria. All decisions regarding public use must take into account the existence of these special areas. The classification of habitats used in designating a SNA and also used in the following section under "Sensitive Habitats" is from the Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland 1986), considered the standard for use by the California Department of Fish and Game.

1. "Di Giorgio Road North" is included because it is the only known site for the rare plant, Gander's Cryptantha, *Cryptantha ganderi*. Located in the lower end of the canyon, next to the valley floor, this area includes park and private land. It is subject to disturbance by vehicles, horses and mountain bikes. Recent conversion to agricultural use as citrus groves has caused further losses.
2. The "Confluence Of Alder Creek Forks" supports the only known locality for San Diego County of the sensitive habitat, Mojave Riparian Forest. Potential threats at this site include overuse by hikers and overnight campers, and destruction by feral horses.
3. "Middle Willows" is identified as an SNA because it contains examples of sensitive Desert Fan Palm Oasis Woodland, Sonoran Riparian Forest, and nesting areas for the endangered least Bell's vireo. The threat to riparian habitat from vehicle use and prolonged, virtually continuous human use during critical periods in the spring is considered significant (CDPR staff ecologists, and U.S. Fish and Wildlife Service Wildlife Enhancement Office, Carlsbad, CA staff).
4. "Lower Willows" is identified as an SNA because it contains examples of sensitive Desert Fan Palm Oasis Woodland, Sonoran Riparian Forest, and nesting areas for the endangered least Bell's vireo. The threat to riparian habitat from equestrians and foot traffic during periods critical to listed species still exists.
5. Upper Willows contains the same resources as Lower and Middle Willows and was omitted from the NDDDB database due simply to an oversight (pers. comm. CDFG).

B. Sensitive Habitats: The following habitats occurring in Coyote Canyon are recognized as sensitive in the State of California's Natural Diversity Data Base (NDDB). Habitats are included as sensitive due to rarity, exceptional habitat value and/or the degree of existing threat(s) to the habitat throughout its range.

1. Desert Fan Palm Oasis Woodland is listed at Salvador Canyon (two sites), Sheep Canyon, Middle Willows and Lower Willows. Out of a total of eighty such oases in California, five are in Coyote Canyon.
2. Mesquite Bosque (stands of five acres or greater) occurs at Lower Willows and is not yet entered into the NDDB database. There are thirteen other known localities for this habitat in California.
3. Mojave Riparian Forest occurs in Alder Canyon. The Alder Canyon site represents one of nineteen known localities throughout the state.
4. Sonoran Cottonwood Willow Riparian Forest occurs in Nance Canyon. Twenty-one other occurrences of this habitat are recorded in California.
5. Sonoran Riparian Woodland occurs at Lower, Middle and Upper Willows. These localities had not been entered in the state database as of September 1993.

C. Aquatic Habitat: Coyote Creek is an especially important resource because it provides the most extensive and well developed wetland ecosystem in the entire 600,000 acre Anza-Borrego Desert State Park. In times of drought, virtually all water courses within southern California dry up. In contrast, within recorded history, Coyote Creek has continually had sections of flowing water throughout the year. Drought does effect flows in Coyote Creek, however, and the extent of flowing surface water may vary from two to twenty linear miles along the main channel as regional drought conditions fluctuate.

Desert aquatic habitat is an integral part of the riparian woodlands and desert fan palm oases of Coyote Canyon. In some sections of the canyon, such as the willow oases, the aquatic habitat occurs within the riparian woodland and is considered functionally a part of the woodland habitat. However, upstream and downstream of each of the permanent oases, out in full sun, calm pools of standing water occur, as well as reaches where the ground is completely dry but the creek is running just below the surface. These aquatic habitats are functionally independent from the woodland and are officially recognized as distinct habitat types.

Each of these aquatic habitat types supports a distinct assemblage of plants and animals specifically adapted to desert streams and the unique conditions present. In Coyote Canyon, sections of the creek directly associated with the riparian stands and with adequate sun and running water are dominated by a filamentous algae, *Cladophora glomerata*, and support a compliment of thirty or more aquatic invertebrate species, including insects and snails as well

as several amphibians and numerous birds. The sections of creek out of the woodland in full sun have a similarly rich emergent insect and amphibian fauna, some unique to these more open areas. The least obvious of these subhabitats is actually below the ground. Known as the hyporheic zone, this portion of the creek flows just below the surface and supports another unique assemblage of organisms adapted to living as deep as six feet below the soil surface.

Research conducted in riparian ecosystems in Arizona, similar to the ecosystem occurring in Coyote Canyon, has documented a sizable movement of energy from the aquatic zone back into the riparian zone, particularly in the form of emerging insects and amphibians. Within Coyote Canyon, aquatic insects emerging out of the creek provide the bulk of the food required by amphibians and riparian birds. Least Bell's vireo, southwestern willow flycatcher, *Empidonax traillii eximius*, swallows, warblers and other birds take a huge quantity of these emerging insects from the creek, the air and from branches and leaves. Therefore the continued integrity of these aquatic systems is critical for the perpetuation of the diversity of biological resources observed in Coyote Canyon. Presently, the sections of creek located out of the roadway appear to be very healthy. During the spring of 1993, U.C. Berkeley scientists under contract to CDPR, identified over thirty species of invertebrates within the creek, including: mayfly, *Callibaetis* sp.; caddis fly, *Hydrophrysche*; midges, *Chironomidae*; water striders, *Microvelia* and *Gerris*; and snails, *Physa* sp. These taxa represent all the major categories of ecological feeders one would expect in this type of creek; grazers, filter feeders, shredders and predators. Additional observations of the UCB scientists include a cursory but systematic survey of stream life in Coyote Canyon (May 7th-9th, 1993) in areas with and without vehicle use. In a one night count, 32 toads and frogs, *Bufo* sp., *Hyla* sp., per ten meters of stream bank were found away from the road compared to one frog per ten meters of stream where the road went through the creek. Although short-term observations such as this do not allow the detection of trends, these observations were made by experienced aquatic ecologists at a critical time of the year when amphibian reproduction and most invertebrate reproduction takes place. These results tend to indicate a less stable aquatic system occurring in areas subject to vehicular traffic.

A more comprehensive study of the canyon's creek ecosystem is a priority and is underway as a part of the general plan inventory for Anza-Borrego Desert State Park. Some of the impacts caused by current levels of human use observed during this and other studies include: (1) the crushing of aquatic vegetation, insects and amphibians by people and horses walking in the creek, and by vehicles driving in the creek; (2) an increased sediment load in the water from vehicle use; (3) destabilization and erosion of the bank and creekbed from vehicle use; (4) contamination of the creek with petroleum distillates from motor vehicles; and (5) fouling of the creek with human waste. Sediment movement is a natural phenomenon and prominent in the creek in winter and late summer. However, increased sediment loads caused by recreational use during critical springtime breeding of aquatic organisms can kill invertebrates and amphibians. Observations of the creek habitat during the spring of 1994 by the UCB scientists documented increased turbidity extending several hundred yards downstream from vehicle activity, and the problem continued long after the

vehicles passed. Sediment contamination is considered to be one of the most important negative influences on the survival of aquatic plants and animals.

During 1991, CDPR engineering geologist K. Vyverberg conducted a site inspection of the roadway in Coyote Canyon during which she quantitatively described the condition of channel morphology along the three perennial reaches of the creek. Long-term and repeated vehicle use had caused the creek to become incised down to bedrock in many sections of the creek (Vyverberg, 1991 and staff observations). Such channelization of the creek causes flood waters to follow the artificially created roadbed, resulting in deeper entrenchment of the road with each rain event. Once the creek flows in the deep cut, the local water table level is lowered or redirected. In addition, the microtopography of the oases changed, with the creekbed (and associated water table) substantially lower than artificially created adjacent upland terraces. These terraces, without disturbance, would have been a part of the floodplain of the creek, not elevated above it. The lowering of the water table may decrease water available to shallow rooted or seedling riparian vegetation and affect a change in the composition of the riparian plant community adjacent to the creek with species more able to sustain drought being favored. Vyverberg's records stated, "The vegetation cover over undisturbed channel reaches is 85 to 100 percent. Along disturbed reaches used as a road by OHVs [four-wheel drive vehicles] the vegetation cover has been reduced to 0 to 20 percent." In addition, oil residues were observed in the stream channel due to frequent vehicle traffic, even to the point of forming slicks along the margins of the permanent stream. Petroleum distillates are extremely toxic to invertebrates and amphibians in the water.

- D. Riparian Habitat:** The importance of riparian habitat (riverine habitat and all components of the stream and streamside ecosystem) to the Coyote Canyon ecosystem is demonstrated by the increase in the following structural and functional values over the surrounding habitat :
- (1) plant and animal diversity and abundance, (2) subhabitat or niche diversity including layering configuration of the vegetation and more "edge", (3) microclimate, most especially increased humidity, (4) water, (5) shade, (6) erosion protection, (7) nutrients and nutrient cycling, (8) corridors for plant and animal movement, (9) endangered species refugia, (10) food for animals, (11) recreation and (12) scientific research potential.

Riparian habitat is critically important habitat in California and especially throughout the southwestern U.S. because the region is generally arid. In areas with thirty inches or more of rainfall, such as in the forested northwestern U.S., riparian habitat is not as notable an issue due to the abundance of water and vegetative growth. As water and vegetative diversity and cover are reduced, the significance of areas providing these resources increases. This phenomenon, when related to wildlife, may be referred to as a magnified habitat value and is particularly evidenced here in the Colorado Desert, where riparian-dependent bird species account for a majority of the total bird use in the region. A study of birds in the arid southwest, found that 77% of all breeding birds were partially dependent, and 51% completely dependent on riparian habitat (Johnson et al. 1977). Furthermore, 83% of native

amphibians and 40% of all native reptiles in California require riparian systems as habitat during all or part of their life history (Brode and Bury, in Warner and Hendrix, 1984).

Significant damage to the riparian wetlands in Coyote Canyon was documented by Vyverberg in her 1991 investigation (as noted above). Her report included the statement, "The present riparian values in Lower, Middle and Upper Willows are threatened with irreversible damage by human-induced changes in the hydrogeologic regime. Geomorphic evidence indicates the Middle Willows reach of Coyote Creek has been brought, by human-induced change, to a cycle of degradation. Given the empirical evidence, the threat that this cycle of degradation will result in 'irreversible damage' must seriously be considered." Vyverberg states that based on the impacts and relevant legislation, Coyote Creek should be closed to vehicle use. Emphasizing the regional significance of Coyote Canyon, Vyverberg states that, "The empirical evidence ..." is unequivocal; more than 90% of the perennial or intermittent streams existing in the southwestern United States prior to European settlement have not survived human-induced disturbance, and are now ephemeral watercourses."

The value and characteristics of riparian habitat in Coyote Canyon are discussed in some detail in sections I, II, and IV.

E. Sensitive Species in General.

A list of the sensitive species known to occur within Coyote Canyon is presented in Table 1. This includes 46 species, five plants and 40 animals with a recognized sensitivity ranging from California Species of Special Concern to officially listed state and/or federal endangered species. Also included in Table 1 is a list of five species expected to occur in the Coyote Canyon watershed that have not been observed and formally documented. Records were obtained from park files, verified field notes, published and unpublished reports, local and State data bases, including the Anza-Borrego Desert State Park data base for animal records, the California Natural Diversity Data Base, Rare Find, Avesbase and the Wildlife Habitat Relational System. (Acknowledgement is made to San Diego County Parks and Recreation Department who provided a master list containing an updated status for all County sensitive species.) Below is a discussion of selected species of critical importance in Coyote Canyon including species with state or federal endangered status and those species of special concern due to their limited distribution and/or dependence on habitat occurring in Coyote Canyon. A number of sensitive species that occur in the canyon are not discussed in detail here because their status in the canyon either is not well known or is thought to be of minor importance to the long-term survival of the species and the ecosystem. These include, the arroyo southwestern toad, golden eagle, loggerhead shrike and black rail.

1. Birds:

- a. **Southwestern Willow Flycatcher, *Empidonax traillii extimus*:** Listed as a Federal Endangered Species and California Endangered species, this riparian species has been extirpated from most of California because of severe habitat loss and population declines. It requires riparian willows for nesting and has been recorded in Coyote Canyon as recently as early June 1993. No nesting has been documented, but suitable habitat appears to be present in the park at the three major willow riparian areas in the canyon. Recent sightings could be migrant individuals or potential breeding birds. Future documentation of their presence in riparian habitat in late June, July or August and observation of breeding activity is needed to determine this flycatcher's status in the canyon. Its dependence on willows suggests maximum protection of the riparian habitat from human impacts in Coyote Canyon is warranted.
- b. **Least Bell's Vireo, *Vireo bellii pusillus*:** Listed as federal and state endangered, this species had fewer than 500 pairs breeding in its entire known range of southern California as recently as 1992. It is totally dependent on riparian willow woodlands of the type found in Coyote Canyon. Lower Willows was designated "critical habitat" under the Federal Endangered Species Act (FESA) in February 1994. U.S. Fish and Wildlife Service staff have reported that Middle and Upper Willows would also have been included as proposed critical habitat if least Bell's vireo had been observed there before this year. Destruction and disturbance of an estimated 95% of the riparian habitat statewide is primarily responsible for the dramatic decline of this vireo. Parasitism by the brown headed cowbird (*Molothrus ater*), a nest parasite that concentrates its activities where horse and cattle congregate, has also contributed to the decline.

The most recent complete census for the park recorded 48 nesting pairs with 17 pairs or 35% in Coyote Canyon in 1993. Since systematic counts of vireos began in the park in 1978, there has been a significant nesting population of at least eight pairs in Coyote Canyon. There are also records of one to two breeding pairs each in Sheep, Cougar and Indian Canyons. In 1992, and prior to storm damage in 1993, there were eighteen nesting pairs in Lower Willows. Following the habitat disturbance resulting from the 1993 storm, five pairs of vireos were observed in remnant riparian habitat at Middle Willows and two pairs at Upper Willows (spring 1993). Researchers reported as early as 1983 that there was suitable nesting habitat present at these two sites, but no nesting was documented until 1993. Perhaps significantly, the number of new pairs at these two sites (7) closely parallels the decline in nesting pairs observed in Lower Willows (6) from the previous year, 1992. One explanation is that there was less available nesting habitat at Lower Willows because of the documented loss of habitat from the winter 1992-93 flood. Vireos tend to return to sites where nesting activities were successful, and it is likely the birds observed in nearby Middle and Upper Willows represent displaced pairs from Lower Willows. Coincidentally, the vireos that established nest sites in Middle and Upper Willows did so during the time

in which the roadway was closed due to storm damage. With proper land management, Upper and Middle Willows can be expected to continue to provide important nesting habitat for vireos.

Threats to the species include anything that would diminish the quality of the nesting, foraging and cover habitat, i.e. the quality of the riparian woodland and adjacent aquatic habitat. Identified problems in Coyote Canyon include: direct vehicle impacts to vegetation and the stream, trimming of the vegetation by visitors to accommodate vehicles, presence of significant numbers of people on foot in the woodland and creek, the spread of tamarisk, *Tamarix ramosissima*, use of Middle and Upper Willows by feral horses, destruction of habitat by floods, and parasitism of vireo nests by the expanding brown-headed cowbird population.

The critical time of the year for least Bell's vireo in Coyote Canyon is during the breeding season, from approximately March 15th to September 15th. As far as is known, the least Bell's vireo in Coyote Canyon obtains all its requirements for nesting, feeding, cover, shade and rearing of young in riparian woodland habitats. Nests are placed about three feet from the ground, usually in dense thickets of willow, arrowweed or mesquite and often near the edge of a thicket. For this reason they are susceptible to disturbance by vehicles, horses and hikers.

Impacts from vehicle noise are a concern. Vehicles passing near nests in Middle and Upper Willows from March into June could easily exceed the 60db threshold established by U.S. Fish and Wildlife Service (Wildlife Enhancement Office, Carlsbad, CA). Noise in excess of 60 db is judged to cause disturbance which may constitute "take". Current California Highway Patrol regulations set vehicle noise levels not to exceed 84db.

Cowbird removal through trapping has been identified as crucial to the survival of least Bell's vireo. A successful trapping program has been conducted in Coyote Canyon since 1986 and will continue. Recent statewide increases in vireo populations are directly attributable to cowbird removal (CDFG).

- c. **Other Sensitive Birds:** A number of other sensitive bird species (Table 1) recorded in Coyote Canyon are totally or partially dependent on riparian woodland in the canyon. They include yellow warbler, *Dendroica petechia brewsteri*, a California Species of Special Concern (CSSC); yellow-breasted chat, *Icteria virens* (CSSC); and California black rail, *Lateralis jamaicensis coturniculus*, a California Threatened and Federal Candidate 2 species. In a 1986 study entitled, "A Survey of the Birds of Riparian Habitats, Anza-Borrego Desert State Park", by WESTEC Services Inc., the following management recommendation was made (prior to discovery of vireos in Middle or Upper Willows): "Recovery of the vireo population in Lower Willows should be stressed by park management since it is entirely coincident with other

resource protection goals of the Department of Parks and Recreation. Also, recovery of the least Bell's vireo will directly benefit virtually all other wildlife species."

2. Mammals:

Peninsular Bighorn Sheep, *Ovis canadensis cremnobates*: Peninsular bighorn sheep are formally proposed as endangered by the federal government and a California threatened species. Coyote Canyon is vital to the future survival of the Peninsular bighorn sheep population in the United States. The estimated current population of sheep in the Coyote Canyon Plan area is about 100, or 25% of the total U.S. population as of 1991. In the last fourteen years the U.S. population has plummeted from 1,180 individuals in 1979 to 380 in 1991, an alarming decline of 67%. During this same period the bighorn population in the park declined 30%, from 400 in 1979 to 280 in 1991.

Although much of this decline has taken place outside the park, the most significant population reduction in the park has occurred throughout the western side of Coyote Canyon in Indian, Cougar, Sheep and Salvador Canyons. Only a few bighorn have been seen in all these canyons over the last 14 years, whereas previously it was common for 50 to 75 sheep to be found in this part of the range. The exact reason(s) for either the local or overall declines are not completely understood, and the bighorn population in Anza-Borrego is currently the subject of an intensive multi-agency study. Nonetheless, the value of Coyote Canyon as an important bighorn range is clear.

Habitat attributes that make Coyote Canyon and its adjacent canyons vital to desert sheep are: high quality forage, including riparian plant species, open space, abundant water, adequate escape terrain, linkage to adjacent mountain masses, and lack of competition from cattle and mule deer. Such sites are very rare in the Colorado Desert.

The willow riparian oases in Coyote Canyon are the most important watering areas for bighorn in the park, and based on observed use, the most important water sources in their entire range (see section II for a description of the canyon). Optimum steep escape terrain, as required by bighorn, is present at all three sites (Upper, Middle and Lower Willows), providing safe access to year round water. Bighorn use the area year round but come down to water more frequently from May through October when temperatures reach into the 90's (degrees Fahrenheit) and above. Coyote Canyon not only provides a stable water supply to wildlife, but contains a diversity of habitat types, elevation ranges, plant communities, and soil types. This diversity provides stability to the bighorn sheep with regards to forage availability, adequate geographic relief for lambing areas, solitude during critical times of the rut and rearing of young.

and opportunities for the sheep to move great distances within their range to seek out seasonal supplies of food and water.

During the rut (or breeding season), from August to November, rams and ewes are more likely to use the lower lying areas in Collins Valley and around Middle Willows. An often overlooked habitat used by bighorn in the canyon is the alluvial fan foothills, such as those bordering Collins Valley and east of Middle Willows. Bighorn often linger to feed here en route to and from water. The value of these areas might not be readily apparent in normal years, but during drought they provide the only suitable forage. In this public use plan, it is important to understand that bighorn depend on a variety of habitats, including low lying areas. Their use of these low areas may be less frequent than typical steep "sheep" terrain, but it is nonetheless essential.

For a discussion of human impacts on bighorn refer to Monson and Sumner, 1980. Determining the impact of various human activities on bighorn sheep is not a simple process. Instances where people stop their vehicles, as occurs along the entire route through Coyote Canyon and especially within the willows areas, have an observable effect on bighorn. A study done at Middle Willows in 1973 showed a 50% decrease in bighorn activity on days when vehicle activity was present versus days when vehicle traffic was absent (Jorgensen, P., 1974). This study and others have documented that bighorn and people normally use water sources at the same time of the day. People traveling the long rough road through the canyon tend to stop and picnic or camp in the shade of the willows (staff observations). For nearly all travelers, the willow oases are an attractive destination point, with visits often occurring at mid-day and lasting for hours. Those who camp at the willows can inadvertently cause significant impacts to bighorn watering as a result of their long occupation of the oases.

Drought, human encroachment, major wildfires, disease epizootics, and similar large-scale influences can create life or death "bottlenecks" for sensitive species such as desert bighorn. "Bottlenecks" can be defined as one or more limiting factors that in a single event or cumulatively can dramatically impact the population for years or even forever. As an example, one year of severe water or food shortage, may causing the bighorn herd to die out or abandon a portion of its range. Drought may have profound impacts on bighorn populations in isolated ranges with only seasonal water sources. The impacts are likely to be somewhat less drastic in a region such as Coyote Canyon, with its stable water resources, if access to the water is not impaired. In cycles of severe drought, such as that during 1989 to 1991, core areas such as Coyote Canyon, provided vital habitat elements necessary to the long-term survival of Peninsular bighorn sheep population.

The current seasonal closure from mid-June to mid-September does not adequately address all the human-caused impacts to the desert bighorn sheep. The need for free access to water usually begins as soon as temperatures reach the 90's, which occurs prior to June 15th. The undisturbed use of lowland alluvial fans and water sources for

rutting activities is important to sheep through the month of October. To properly manage vehicular and other public use in Coyote Canyon for bighorn, immediate increased protection measures are believed necessary.

3. Reptiles:

Desert Tortoise, *Gopherus agassizi*: Listed as a federal and state threatened species, desert tortoise occurs in Coyote Canyon, yet its status is unclear. The park is outside the recognized distribution of the tortoise, but the species is found in the mountains east of Salton Sea, forty miles from Coyote Canyon. Most records for the park are from Sheep Canyon in Coyote Canyon and include nine records from 1973 to 1993. An observation during April 1993 of newly hatched tortoises is thought to represent captive individuals released into the park, or perhaps a remnant natural population. In any event, the tortoises in Coyote Canyon are entitled to full protection under the law. Potential impacts include being run over by vehicles or captured and removed by visitors.

- F. Cultural Resources:** The major cultural resources in the canyon are Native American sites, the remains of early pioneer settlements and the Juan Bautista de Anza Trail, a National Historic Trail. Currently, much of the trail through the canyon is used by hikers, equestrians and motor vehicles.

Many of the archaeological sites in Coyote Canyon are protected from human intrusion due to their isolation and inaccessibility. Some of the most sensitive sites, however, are located along or close to roadways or trails. In past years some progress has been made toward protecting the cultural resources.

The rerouting of the road out of Lower Willows, as well as a successful rerouting of another segment of road just north of Lower Willows have resulted in significant protection and stabilization of a large aboriginal village site. Prior to the closure of the above road, severe compaction, erosion, and destruction of this village site occurred almost daily. Illegal activities such as collecting artifacts and pothunting in burial sites happened frequently.

There is no assurance that the rerouting of trails, roads or the closure of roads will bring about a 100% protection for archaeological sites in Coyote Canyon. Recent flooding in the canyon demonstrates that human-made sites are transitory in nature. However, past experience has shown that when roads and trails are routed away from archaeological sites, there is significantly less erosion and compaction, less pothunting, and less inquisitive artifact collecting.

Archeological Areas Sensitive To Road Adjustments:

Throughout the length of Coyote Canyon, from the Di Giorgio Road entrance to the northern boundary gate, the following archeological remains have been identified as occurring on or adjacent to the present jeep road/trail. Protection of these cultural features need to be considered in planning any future road/trail alignments.

- artifacts
- cremations (aboriginal and historic)
- food processing (milling features and roasting pits)
- historic structures (Bailey's cabin)
- sweat lodges and shelters
- rock art
- rock shelters
- village sites and middens

G. Recreation Conflicts: As stated earlier, the canyon attracts thousands of recreational visitors each year. They come to experience the unique qualities of the canyon including its geology, flora, fauna and scenic beauty. Whether seeking solitude, inspiration, knowledge or just plain relief from urban life, visitors arrive by and travel through the canyon in several ways including motor vehicles, mountain bikes, on horseback and on foot.

Records for vehicles using lower Coyote Canyon, below Lower Willows, have been kept by patrol rangers since 1979. An estimated one-fourth or less of all vehicles counted go over the Lower Willows bypass or come down from Anza. (No distinction is made in the park records as to how far up the canyon counted vehicles travel, but all staff with extensive experience working in the canyon agree on the above estimate.) During an average year about 9,000 vehicles use this area, with a range of 5,000 to 17,000 vehicles per year. There are no records for the number of hikers or equestrians using the canyon above the south end of Lower Willows.

The canyon's own popularity has become, to a degree, its enemy. As visitation increases, opportunities for solitude and reflection decrease, particularly in the most desirable areas such as the oases. User conflicts, resource damage and a reduction in the quality of each visitor's experience can result. It is the careful and equitable balancing of these impacts which creates the current management challenge for the Department in Coyote Canyon.

While all users have some impact on the canyon's resources, motor vehicles have the greatest capacity to create change in the canyon environment. In the canyon, motor vehicles are allowed in Collins Valley as well as in the corridors identified as primitive roads. The streams of vehicles moving along the narrow corridor, through Coyote Canyon, up and down the various tributary canyons each season is technically within the letter of the law. However, the impact they collectively create is inconsistent with the stated purpose of adjacent

wilderness areas. Vehicle-caused noise, visual presence, pollution and erosion have combined to alter the unique wilderness character of the canyon, particularly in the riparian and stream environments of the three oases.

The Canyon is a unique and valuable natural resource. It is a place of great beauty and interest, and it is one of the most important natural resources in the State. The Canyon is a place of great beauty and interest, and it is one of the most important natural resources in the State. The Canyon is a place of great beauty and interest, and it is one of the most important natural resources in the State.

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III. LEGAL BASIS FOR PLAN ACTIONS.

A number of policies directing the actions of state and federal agencies as well as formal mandates establish our responsibilities to manage resources in perpetuity. These policies and laws are mentioned below as they relate to specific resources contained within Coyote Canyon.

- A. Significant Natural Areas.** There are four SNAs in Coyote Canyon: Di Giorgio Road North; the Confluence Of Alder Creek Forks; Middle Willows; and Lower Willows, detailed in Section II.

The Significant Natural Areas Act of 1981 mandated the delineation of SNAs in California. The Fish and Game Code, Sections 1930-33, addresses SNAs and states that the Department will "seek maintenance and perpetuation of the State's most significant natural areas for present and future generations in the most feasible manner." The Public Resources Code (PRC), Section 5019.53 states that "the purpose of State Parks shall be to preserve outstanding natural, scenic and cultural values." In addition, the California Department of Parks and Recreation (CDPR) is signatory with other state and federal resource entities to the "Memorandum of Agreement of the California Coordinated Regional Strategy To Conserve Biological Diversity, September 19th, 1991." Clearly, the Department has the responsibility to provide reasonable protection for SNAs occurring in Coyote Canyon and the natural, physical and cultural features they contain.

No specific action is recommended for SNA numbers 1 and 2. At this time, data are lacking to determine the most appropriate action to reduce impacts to the Di Giorgio Road North area (SNA #1). Public use at the "Confluence Of Alder Creek Forks" (SNA #2) is not well documented but is thought to be of minimal impact, and therefore, no change in management is recommended at this time. The "Alternatives" section addresses issues related to SNAs #3 and #4, Middle and Lower Willows respectively.

- B. Sensitive Habitat.** There are five sensitive habitats occurring in Coyote Canyon, including: Desert Fan Palm Oasis Woodland; Mesquite Bosque; Mojave Riparian Forest; Sonoran Cottonwood Willow Riparian Forest and Sonoran Riparian Woodland. Section II of this document contains more descriptive information on these habitats.

Public Resources Code (PRC), section 5019.53 and the Agreement on Biological Diversity, as mentioned above with regards to the preservation of SNAs, also apply to the protection of sensitive habitats. In addition, PRC section 21001.C and the State of California California Environmental Quality Act (CEQA) Guidelines state that State agencies shall "prevent the elimination of fish or wildlife species due to man's activities, ensure that fish and wildlife populations do not drop below self-perpetuating levels and preserve for future generations representations of all plant and animal communities and examples of the major

periods of California history." Article 5, section 15065a of the CEQA Guidelines further states that "mandatory findings of significance occur where any project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of fish or wildlife species, cause fish or wildlife populations to drop below self sustaining levels, threaten to eliminate a plant or animal community." The protection of sensitive habitats may qualify under the CEQA definition of a "project" because the routing of trails and roads, and certain public use policies are "discretionary". These policies and laws establish the Department's responsibility to manage and protect these habitats to the fullest extent possible.

- C. Aquatic Habitat.** There are miles of flowing creek in the main drainage of Coyote Canyon. During dry times there can be as few as two miles of creek, while during wetter months there can be over twenty miles. A more detailed description of the aquatic habitats is found in Section II.

As mentioned above, PRC, section 5019.53, provides the responsibility to CDPR to preserve outstanding natural values. CEQA/PRC section 21001.C, require consideration of management actions that prevent the elimination of wildlife species and communities, and CEQA, Art. 5, section 15065A, regarding findings of significance where wildlife or plant species or populations are threatened, are germane also to the maintenance of healthy aquatic ecosystems. The California Fish and Game Code for Streambed Alteration, 1601-1603 requires CDPR to enter into a permit process regarding the establishment and maintenance of trails and roads in streams, including Coyote Creek. In addition, the wetland areas of coyote creek receive protection under the Keene-Nejedly California Wetlands Preservation Act of 1976 as detailed in PRC sections 5810-5818. Specifically, sections 5810, 5811, 5812 and 5816, identify the responsibility of the CDPR to protect and preserve wetland habitats in Coyote Canyon. Furthermore, section 402 of the U.S. Clean Water Act prevents discharge of pollutants into such waters, including motor vehicle oil and fuels.

- D. Riparian Habitat.** Coyote Canyon has over 200 acres of desert riparian habitat, principally occurring at Lower, Middle and Upper Willows, in the main drainage of the canyon.

As mentioned above, PRC, section 5019.53, provides responsibility to CDPR to preserve outstanding natural values. CEQA/PRC, section 21001.C, require consideration of management actions that prevent the elimination of wildlife species and communities, and CEQA, Art. 5, section 15065A, regarding findings of significance where wildlife or plant species or populations are threatened, are germane also to the protection and maintenance of riparian ecosystems. The California Fish and Game Code for Streambed Alteration, 1601-1603 requiring CDPR to enter into a permit process regarding trails and roads in streams, i.e. Coyote Creek, is also relevant. All the riparian habitat in Coyote Canyon is considered "wetlands". This habitat has protection under the Keene-Nejedly California Wetlands Preservation Act of 1976. Specifically, PRC sections 5810, 5811, 5812 and 5816 identify the responsibility of the CDPR to protect and preserve wetland (riparian) habitat in Coyote